

Saimaa University of Applied Sciences  
Faculty of Business Administration Lappeenranta  
Degree Programme in International Business

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## **Orientation guide for a supply chain coordinator, case company Stora Enso Oyj**

Thesis 2017

## **Abstract**

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44 pages

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The main objective of the thesis was to design and create an orientation guide for a supply chain coordinator working at Stora Enso Imatra Mills Consumer Board. The thesis was done as a practice-based thesis which consisted of two parts: a functional work, also known as development work, and a written report describing the thesis process. Practice-based theses target and detect problems in the contracting firm and provide solutions.

Data for the orientation guide were mostly collected by the enterprise resource planning system called Fenix. The theoretical framework included key concepts, such as enterprise resource planning (ERP), supply chain management (SCM) and practice-based thesis. The information in the theory section was mostly gathered from literature, journals, articles, newspapers, and online sources.

The final outcome of this thesis was divided into two parts. The first part, an orientation guide, was given to the company and the second part, a written report describing the process was designed for reporting purposes for the Saimaa University of Applied Sciences. The outcome of the thesis was a concrete tool for the company's orientation process, assisting not only new employees but also existing employees performing necessary and key functions. Overall, the orientation guide amounted to 88 pages and the thesis report to 44 pages.

Keywords: enterprise resource planning, supply chain management, practice-based thesis

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## Concepts

ERP	Enterprise Resource Planning; planning and synchronizing all the resources of the company as a whole
SAP	Enterprise resource planning system and name of the company (Systems, Applications & Products in Data Processing; Systeme, Anwendungen und Produkte in der Datenverarbeitung)
SC	Supply Chain; a system of activities, in which the goods move from supplier to the end user
SCM	Supply Chain Management; management and optimization of the flow of goods and services

# **1 Introduction**

The main purpose of this practice-based thesis is to design and create an orientation guide for a supply chain coordinator working at Stora Enso Imatra Mills Consumer Board. The orientation guide specifically targets new employees starting in the position for the first time, as well as rotation workers and substitutes. The practice-based thesis consists of two parts. The first part focuses on a functional work, also known as development work, while the second part is a written report that describes the thesis process. (Vilkka & Airaksinen 2004, p. 9.)

This is a practice-based thesis because the outcome is a tangible product - an orientation guide that the contracting firm can take advantage of in the future to improve their induction for new employees. The theoretical section is separated from the orientation guide. In the former, I justify the choices made in the latter. The choices are also affected by the expectations and instructions received from the contracting firm.

## **1.1 Background**

I was personally working as a supply chain coordinator for five months in the summer 2017 at Stora Enso Imatra Mills Consumer Board, and the commissioner of the thesis was found through an internship. As I was based in the supply chain division, it was natural to attach and develop a thesis subject in that area.

The first week of the induction was reserved for a general introduction to Imatra Mills, including health and safety aspects. In the second week, we were introduced to individual tasks. To my surprise, I noticed that the company did not seem to have sufficient instructions and guidelines for new employees starting in the position of supply chain coordinator for the first time, which inspired me to choose this topic for my thesis.

While being trained for the position, all instructions had to be written down by hand. It was not only time-consuming but also inefficient for learning. The whole system was completely new to me - numbers were running back and forth in my eyes for the first weeks. For someone without existing professional background

in this field, the system seemed strange and confusing. It was very hard to mentally organize new data in the beginning, as large amounts of information were given without much time to process them. For these reasons, I believe that having a well-developed orientation guide could help the company make inductions more efficient and cut costs in the long term.

Personal interests also influenced my choice of this particular thesis topic. I wanted to focus on the supply chain division, as I aspire to apply for a master's degree in supply management after the current degree. I am very passionate about the field of education. Through the thesis, I seek to expand and deepen my knowledge about the supply chain and supply chain management.

## **1.2 Purpose and objectives**

The purpose of this thesis is to produce guidelines and instructions for a supply chain coordinator working at Stora Enso Imatra Mills Consumer Board. The aim is to have a complete orientation guide by the end of the thesis process in December 2017.

Employees who have been working for the company for a long time are often not aware of everything that a new employee does not yet know. Old employees may consider many things self-evident, resulting to poor and insufficient orientation to new employees. New joiners might also be discouraged of asking certain questions thinking that they might be too simple or trivial. This setting does not promote learning.

Having been a new employee recently, I have a fresh and accurate experience of what a new joiner does not know about the ERP system used in the company. There is no publicly available information about the system, as it has been developed and implemented in-house. Thus, it is not possible to use the system or learn how to use the system anywhere outside of the company. Hence, I possess unique knowledge as to building a comprehensible orientation guide for a new employee without existing background in this position.

However, the orientation guide needs to be properly planned in advance, as planning plays an important role in the success of a project (Kettunen 2009, p. 54). A

plan should discuss the background, purpose, target group, work plan and usage of the resources in the project (Silferberg 1999).

Imatra Mills has one existing orientation guide written in Finnish from many years ago, but many procedures have changed or expired over time. This is why updating and expanding the old orientation guide can make a major difference. Furthermore, because the ERP system used at Imatra Mills functions in English, it is more practical to produce a guidebook written in English rather than Finnish. It is more precise to communicate using the target language, as translation might risk distorting the core meaning.

The ERP system used in the company is something that is not taught at any schools, as the system has been exclusively custom-designed for the company. Thus, the learning process all begins from zero, as it is not possible for new employees to study how to use the system without first working there. Adopting the functions and features of the system is time consuming. However, given the limited time reserved for induction, new employees are practically expected to absorb new things very quickly. This puts a lot of unnecessary pressure on them, while a well-designed orientation guide would allow them to settle to the job much faster.

The orientation guide will be given to the commissioning company not only in PDF-format but also as a Word-document. This is so that the administrator can make any additional changes easily and quickly in the future. The PDF-format will be available for the users in the Intranet, where everyone can find and use it without extra effort. The Word-document will only be available for the administrator of the orientation guide, so that not everyone is able to make changes in the report.

### **1.3 Limitations**

The orientation guide will include very simplistic, clear and detailed instructions on how to handle orders step by step. It will contain all the basic information that a supply chain coordinator would need to know in their daily work. Additionally, it will include examples of problematic situations and how to cope with them.



In the orientation guide, there will be numerous pictures, tables, graphics and screenshots to demonstrate functions and features of the system in an understandable way. To perform the necessary functions, the employee is required to use and remember a significant amount of terminology. The orientation guide would also address this area by providing a comprehensive glossary in the end of the report.

Through this orientation guide, the company can train new employees more effectively. A new employee will likely adopt the procedures more quickly and the trainer will be able to concentrate on his or her own tasks. This is likely to raise the overall productivity of the company compared to a scenario where a new joiner is trained for many weeks or even months.

While this study includes all the basic daily tasks of a supply chain coordinator at Imatra Mills Consumer Board, certain features, elements and functions of the EPR system are not covered. This is because of the large number of tasks in overall use. When a new person starts his or her job there for the first time, it is not assumed that they become professionals of everything right away and that is why, the orientation guide will only include the most important functions used in the daily work of a supply chain coordinator.

Because this orientation guide is targeted to newcomers, some of the contents may seem trivial and overly simple for those who have been working in the position for a long time. However, it is worth noting that the guide can be of use to more experienced staff as well. It is a resource that they can use to review processes that are no longer familiar.

The orientation guide is also useful for routine workers and substitutes in case of illness. In the commissioning company, the supply chain division has been divided into smaller teams. If an employee becomes ill, someone from the team will substitute for her or him. The teams usually consist of four to six members, and it is expected that everyone in the team is able to substitute one another in case of absence. Teams are formed so that the members focus on similar regional markets. This is so that each team member can have a good understanding of

the business culture in their target regions and is therefore able to substitute colleagues in the same team.

The functional part of this thesis is confidential. It contains data and information obtained through a company position that cannot be handed over to unauthorized persons or distributed to third parties without permission. In particular, this concerns any information related to the systems used at Stora Enso. Consequently, the thesis proposal and thesis report only contain public information about the company.

#### **1.4 Structure**

This report is the written component of the thesis, produced to describe the thesis process. The functional component of the thesis, namely the orientation guide, has been separated from this report for confidentiality reasons.

The first chapter of this report is the introduction. It covers the background, purpose, objectives, limitations, and structure of the thesis. The second chapter presents the case company Stora Enso Oyj and introduces the concepts closely related to the company: Imatra Mills, Consumer Board, Supply Chain Coordinator and Fenix. The third chapter introduces the theoretical framework consisting of the key concepts of enterprise resource planning (ERP), supply chain management (SCM) and practice-based thesis. The fourth and fifth chapter contain a description and assessment of the thesis process and the final chapter presents the conclusions and discussion.

The structure of the functional work is very different from the thesis report. It specifically addresses the target group and has therefore been written to be as understandable as possible for the readers. The orientation guide introduces the necessary functions and tasks in chronological order, which makes it easier for a new employee to read and follow the instructions.

## 2 Presentation of the case company

This chapter includes a short presentation of the case company including concepts of Stora Enso, Imatra Mills, Consumer Board, Supply Chain Coordinator and Fenix described in more detail.

### 2.1 Stora Enso

Stora Enso provides renewable solutions in wooden constructions, packaging, biomaterials, and paper at international markets (Stora Enso 2017a). Stora Enso aims at replacing fossil based materials by developing and innovating new products and services, which are based on wood and other renewable materials. Stora Enso has major operations in four continents and the company consists of five divisions, which are presented in more detail in Table 1. (Stora Enso 2017b.)

STORA ENSO DIVISIONS	
Consumer Board	provides and develops consumer packaging boards for printing and packaging applications
Packaging Solutions	develops fibre-based packaging, for example, corrugated fibreboard and paperboard, operates at every stage of the value chain from pulp production and material and packaging production to recycling
Biomaterials	offers a variety of pulp grades to meet the demands of paper, board, tissue, textile and hygiene product producers
Paper Division	provides best-in-class paper solutions for print media and office use as well as paper supply management
Wood Products	division provides versatile wood-based solutions for building and housing, for example, construction materials and fuels

Table 1. Stora Enso Divisions (Stora Enso 2017a)

Stora Enso is a Finnish-Swedish pulp and paper manufacturer, which was established in 1998 through a merger of two companies: the Swedish company called Stora Kopparbergs Bergslags Aktiebolag (Stora) and the Finnish company called Enso Oyj. Originally, Stora was a copper mining and forestry products company, whereas Enso Oyj was a forestry company. Stora Enso expanded quickly after

the merger and it acquired wood products and paper merchant businesses in Europe. (Stora Enso 2017b.)

The company employs some 25 000 people around the world, 6 700 employees in Finland, and it is publicly listed in Helsinki and Stockholm. The headquarters is located in Helsinki, Finland. Sales revenue totalled EUR 9.8 billion in 2016, which was 2,4% more than in 2015, whereas operating income amounted to EUR 884 million in 2016. (Stora Enso 2017d.)

Stora Enso's main customers include paper converters, publishers, brand owners, retailers, paper and board producers, wholesalers, printing houses, and construction and carpentry industry companies. The major stockholders of Stora Enso are Foundation Asset Management, Solidium, The Social Insurance Institution (Kansaneläkelaitos), Varma Mutual Pension Insurance Company (Keskinäinen työeläkevakuutusyhtiö Varma), MP-yhtiöt, and Ilmarinen Mutual Pension Insurance Company (Keskinäinen Eläkevakuutusyhtiö Ilmarinen). (Stora Enso 2017f.)

## **2.2 Imatra Mills**

Imatra Mills contain two separate production units, which are called Kaukopää and Tainionkoski. The current mill manager is called Jari Tiura. Together the units employ around 1,000 people and they produce approximately one million tonnes of paper and board every year. A huge part of the production, amounting to 90 per cent, is exported mostly to countries in Europe. Imatra Mills are Stora Enso's largest mill, the largest cardboard producer in Finland and one of the largest forest industry integrators in Europe. (Stora Enso 2017c.)

The construction works of the Kaukopää pulp mill started in the summer of 1934 and it was designed by the M.Sc. Eng. Eero Kalaja and Pentti Halle, whereas Väinö Vähäkallio was responsible for the architecture. Additionally, Stora Enso has a research centre located at Tainionkoski, Imatra, in the old Tornator's buildings. Previously, Imatrankoski plant also belonged to the mill complex. (Aikakone - Suomen Elinkeinoelämän Keskusarkisto 2015.)

Food service boards for paper cups, food packages, and packaging board for beverage cartons belong to the mill's specialties. The confectionery, food, and tobacco industries form a group of the most typical customers for Imatra Mills. The mills also produce graphical boards used for book covers, cards, and luxury high-quality packaging papers. (Stora Enso 2017c.)

### **2.3 Consumer Board**

Consumer Board Division primarily provides and develops consumer packaging boards for packaging and printing applications. A wide board and barrier coating selection is suitable for the design and optimisation of packaging for liquid, food, pharmaceutical, and luxury goods. Consumer Board aims at expanding in growth markets, for example, Asia Pacific and China to meet increasing demand in the future. (Stora Enso 2017e.)

### **2.4 Supply chain coordinator**

The supply chain coordinator is responsible for managing the buying and delivery process of goods on behalf of the company. A person responsible for the position must be organized and she or he should cope well with pressure, as the role requires a lot of responsibility. (Alchemy Recruitment Ltd 2017.)

Supply chain coordinators' daily tasks include order handling and order follow-up, export documentation, daily cooperation with customers and sales network, communication with different stakeholders, for example, ports, logistics network and sheeting centres, cooperation with production planning and technical customer service, and inventory management and reporting. (Alchemy Recruitment Ltd 2017.)

### **2.5 Fenix**

The ERP system used in the company is called Fenix. It is a global, real-time solution and information system, designed exclusively for Stora Enso and its customers, which means that the system cannot be directly transferred to another company. The system follows in real time at which stage of the production chain

the product is, which improves customer service, increases the efficiency of operations, standardizes reporting, and enables overall view of orders and invoices. It was initially launched in 2000 and it is unique in the forest industry. Fenix consists of tools, which cover the entire order through delivery chain of paper and board production and enable the management of orders efficiently. The system aims at offering excellent customer service experiences. (Tappi n.d.)

### **3 Theoretical framework of the thesis**

Theory or theoretical framework means a unified and systematic presentation relating and applying to separate cases. It also means the perspective from which the subject of the study is examined and a conceptual and mind-driving organization related to a research. (Vilkka 2015, p. 227.)

The theoretical framework of this thesis includes concepts, such as enterprise resource planning (ERP), supply chain management (SCM) and practice-based thesis, which are introduced in more detail in the following subchapters.

#### **3.1 Enterprise Resource Planning (ERP)**

##### **3.1.1 Concept**

An enterprise resource planning system, abbreviated as an ERP system, is regarded as a core software program, which companies use to coordinate and integrate information in every area of the business (Monk & Wagner 2012, p. 21). It is an integrated, modular, and extensive enterprise information management system, which commonly has one common database that combines the data streams of different functions (Logistiikan maailma - Reijo Rautauoman säätiö 2015a).

The system contains and helps maintain basic information of the company and information about different events (Haverila, Miettinen & Uusi-Rauva 2009, p. 430) and it guides the company's work and resources. Efficient use of resources is the foundation for economically profitable operations. As the customer expects

to receive the ordered product as planned, the company must meet the customer's needs and wants. (Kalliokoski, Simons & Mikkola 2001, p. 41.)

### 3.1.2 Business functions

A business function or department means an organizational unit, where activities are performed (Hoeven 2011, p. 1). Typically, companies have four main functional areas of operation (Monk & Wagner 2012, p. 2). Examples of functional areas of operation and their business functions are presented in more detail in Table 2.

Functional area of operation	Marketing and Sales	Supply Chain Management	Accounting and Finance	Human Resources
Business functions	Marketing a product	Purchasing goods and raw materials	Financial accounting of payments from customers and to suppliers	Recruiting and hiring
	Taking sales orders	Receiving goods and raw materials	Cost allocation and control	Training
	Customer support	Transportation and logistics	Planning and budgeting	Payroll
	Customer relationship management	Scheduling production runs	Cash-flow management	Benefits
	Sales forecasting	Manufacturing goods		Government compliance
	Advertising	Plant maintenance		

Table 2. Examples of functional areas of operation and their business functions (Monk & Wagner 2012, p. 2)

Functional areas of operation could include, for example, Human Resources (HR), Accounting and Finance (A/F), Marketing and Sales (M/S), and Supply

Chain Management (SCM). However, depending on the company, there might be more functional areas than presented in Table 2.

The common database is used by all the different functions, which enables transparency through the organization, as all the operations utilize the same up to date information. This requires that the information is correct, and that is why, entries such as material balances must be done correctly and timely. (Logistiikan maailma - Reijo Rautauoman säätiö 2015a.) The ERP system can also be regarded as rather necessary, for example, for those, whose production and work emphasize the importance of logistics over the borders of the organization (Vilpola & Kouri 2006, pp. 14-15).

### **3.1.3 Purpose and objectives**

The goal of the system is to coordinate resource management and computing/data processing, which enables other users to use the ERP system without having to record data in their own systems. This feature is well represented, for example, in large organizations, which have sales offices around the world. (Haverila et al. 2009, p. 430.)

The purpose of the management system is to improve operations, efficiency, transparency, and economics in order to serve customer's needs and wants as well as possible. Efficiency can be improved by reducing overlapping assignments and optimizing capacity utilization, whereas consistent information available in different functions increases transparency. In terms of economics, resources and stock sizes are to be paid attention to. (Logistiikan maailma - Reijo Rautauoman säätiö 2015a.)

One of the objectives of the system is to improve competitiveness and profitability of the company. With an ERP system, it is possible to anticipate production, which improves quality and delivery speed. (Vilpola & Kouri 2006, p. 7.) To summarize, ERP means synchronizing and planning all resources of an enterprise as a whole (Hoeven 2011, p. 7).



### 3.1.4 History

Before the introduction of integrated systems, every part of the company had its own independent system where the information was stored. This meant in practice that marketing had its own information system, production its own, and so on. Each information system had its own software and information technology needed to run it. These systems were called silos, also known as stovepipes, because each system had an independent stack of information, a silo, separated from other systems. (Monk and Wagner 2009, pp. 20-21.)

The development of ERP systems began in the 1960s. The first ERP systems were very simple compared to today's ERP systems; their main purpose was only to track inventory levels. (Kettunen & Simons 2001, p. 46.) In Figure 1, the main milestones of ERP evolution through the decades are presented in more detail (Monk and Wagner 2009, pp. 20-21).



Figure 2. Evolution of ERP history (Monk & Wagner 2012)

In the history of ERP, five significant events can be identified accordingly. It all started in 1960's, when Inventory Management and Control (IMC) was introduced. The 70's and 80's included different versions of Material Requirements

Planning (MRP): MRP and MRP II. MRP calculated the production schedule based on orders and sales forecasts, whereas MRP II was designed for controlling production processes. Material needs and delivery time were calculated for the different stages of production processes and cost accounting and financial management were also added to MRP II. (Arola & Vainikka 2008.)

Over the past 30 years, ERP has been affected by major changes. Systems became more common in the 1990s, when people noticed that one system can compensate multiple separate systems. ERP systems increased efficiency, which minimized possible extra work steps. (Lahti & Salminen 2008, p. 36.) Right before the 21<sup>st</sup> century, ERP was introduced and it was further developed as extended ERP, which extends from outside the company to various stakeholder groups (Arola & Vainikka 2008).

The importance of ERP systems has been growing steadily in corporate governance (Haverila et al. 2009, p. 430) as the amount of mobile information and data in business is growing constantly, which has increased the need for information technology (Lehtonen 2004, p. 127). Nowadays, ERP systems provide the foundation for a great range of e-commerce-based processes (O'Leary 2000, p. 1), which have become more common in recent years, especially in large companies (Lehtonen 2004, p. 139).

### **3.1.5 Advantages and disadvantages**

ERP as a whole is a very broad concept. With the system, the company's management measure real-time business results and make business more efficient with the help of data received from the system. (e-Devel 2012.)

However, a common database has its own advantages and disadvantages. In terms of functionality, it is important that the data is up to date. Therefore, advantages of the common database can be utilized and functions can use the same and up to date database. A common database reduces duplication and overlaps in the data network. However, attention to the accuracy of basic information must be paid carefully. Advantages of the system also include improved

security and consistency of data, high-quality customer service, and customizable and easier reporting. A common database also provides complete visibility into all the crucial processes and automatic workflow across departments and functions. (Logistiikan maailma - Reijo Rautauoman säätiö 2015a.)

Disadvantages of a common database are worth mentioning as well. Annual maintenance costs are 80% of the costs of the entire lifecycle of the system. The total costs are 5-10 times the costs of software and devices. Costs of devices, software, software changes and development, and implementation and training can be identified and recorded, whereas, it is harder to analyze the costs of the contribution of internal experts and company management. (Karjalainen 2007, pp. 5-8.)

Additionally, system modification, data transfer and system testing, training of administrators and users and technical support easily lead to delayed and undone tasks. Many problems and costs are also caused by the incompatibility of information systems: it is difficult for subcontractors to keep the systems running smoothly because they need to maintain systems with many different customers. Dependence on information systems causes vulnerability in the event of service breaks, and will cause disruption to doing business very likely. (Karjalainen 2007, pp. 5-8.)

### **3.1.6 Implementation process**

The starting point for small and medium-sized enterprises (SME) for exploiting an ERP system is slightly different from that of large companies, as they have different requirements from the system. There are plenty of different ERP systems available on the market. However, comparison of the systems with one another is generally not very productive, but each company should rather try to clarify its own goals for the system and the critical features of the system it requires in terms of its own operations. (Logistiikan maailma - Reijo Rautauoman säätiö 2015c.)

System projects can be very large and demanding. Generally, a successful system project requires not only the organization to expand and deepen its own expertise but it might also need external expertise. Not all essential functions may be found in the ERP system that the company uses, but a variety of separate systems might be linked to the system. (Logistiikan maailma - Reijo Rautauoman säätiö 2015c.)

The first steps for the user of the system before implementing the ERP system are, for example, re-engineering of the business processes, editing and testing of the system, and planning the introduction and training of users (Vilpola & Kouri 2006, pp. 14-15). By implementing these actions, the introduction of an ERP system will be much smoother (Kettunen & Simons 2001, p. 25).

However, one of the most common problems in using information technology is the ongoing failure of projects. The reasons for failed projects include, among others, that goals have not been reached or that schedules and costs do not meet the agreed limits. Simplification of information technology and continuous development to improve usability requires users to use complex structures, which take a great deal of time to build. (Tiirikainen 2008, pp. 33-38.) The most common risks in the deployment of the project are, for example:

- excess of the budget
- poor user-friendliness of the user interface
- inflexibility of the ERP system
- excess of the time limit
- temporary halt of the project
- poor reliability and stability of the system
- weak financial situation of the company. (Iskanius 2009, pp. 2-3.)

The challenge is to make a flowing process because companies have different systems, procedures, equipment and software available (Iskanius 2009, pp. 2-3).

However, the biggest problems in the implementation of ERP systems are usually due to human errors. Critical factors in the success of the project also include management commitment, the project manager's and project team's contribution,

redesign of business processes, and performance measurement. (Logistiikan maailma - Reijo Rautauoman säätiö 2015c.)

Before implementing the ERP system, it is very important to inform all the employees of the company of how the new system and procedures will help the company reach its goals. Project scheduling and budgeting should be realistic and it is preferable to be prepared for any delays as they are very likely to occur at some point. (Logistiikan maailma - Reijo Rautauoman säätiö 2015c.)

In large companies, it is important to use the same ERP system at all locations to facilitate the information processing within the company when the same information is used by each location in real-time (Mero 2011).

### **3.1.7 Present day**

ERP systems have developed simultaneously with the development of other technology, for example, today's ERP systems utilize Internet technology very widely (Granlund & Malmi 2003, p. 33). The sceptical attitude towards the systems in the early times has also changed and the perception of the ERP system as the company's "brain" lives strong today. Due to the years of development, software companies are able to provide all the features that customers need in the same package. Combining data enables the company to carry out versatile and comprehensive analyses of the business. (Lastumäki 2011.)

Examples of companies, which offer ERP systems nowadays, include not only large international enterprises, for example, Oracle, Epicor, Infor SAP, Microsoft but also smaller domestic enterprises, for example, Visma, Maestro, Solteq and Digia. Some of the systems are generally applicable to an industry, but previously, companies have started to produce systems which are more sector-specific solutions. Additionally, SMEs have started to purchase these solutions more and more because new technologies lower the start-up costs. (Ketola 2009.)

Development of information technology has enabled today's ERP systems to have, in practice, an unlimited amount of computational capacity and main

memory (e-Devel 2012). Additionally, nowadays, the number of different ERP systems available is significant. The problem has turned out to be that the company has rather difficulties with choosing the most useful system and suitable for their needs. (Kettunen & Simons 2001.)

Nowadays, it is very common to use ERP systems in the cloud, which enables users to use the system outside the company with a remote server. The cloud lowers operational expenses and capital expenses, since it eliminates the need for enterprises to buy software and hardware or hire additional IT staff. (Oracle 2017.)

## **3.2 Supply Chain Management (SCM)**

### **3.2.1 Definition of Supply Chain (SC)**

Before discussing the concept of Supply Chain Management, it is crucial to introduce another key term called Supply Chain. A supply chain is a network in which various organizations cooperate to guide and develop material or service flows, as well as money and information flows, related to them. In the supply chain, each organization has its own role and the structure of the supply chain depends on the company's products, industry, and customers. (Logistiikan maailma - Reijo Rautauoman säätiö 2015b.)

A supply chain connects the company and its suppliers to distribution organizations and customers. The supply chain is therefore an entity in which cost efficiency, customer orientation, and added value creation are emphasized. (Logistiikan maailma - Reijo Rautauoman säätiö 2015b.) The supply chain can be either a network of different companies or a single entity owned by one organization. In a case with, more than one organization, the parties are connected to each other's processes and functions that together produce added value from the client's point of view. (Viitala & Jylhä 2006, p. 155.)

### 3.2.2 Definition of Supply Chain Management

After understanding the term Supply Chain, it is crucial to introduce Supply Chain Management (SCM), which means comprehensive planning, guidance and management of the material flow of the company network, and related information and cash flows in order to maximize value to customers (Logistiikan maailma - Reijo Rautauoman säätiö 2015b).

Supply chain management includes developing production plans, ordering and receiving raw materials, manufacturing products, maintaining facilities, and shipping products. In order to function properly, supply chain management needs information from various functional areas, which is presented in Figure 2. (Monk & Wagner 2012, p. 247.)

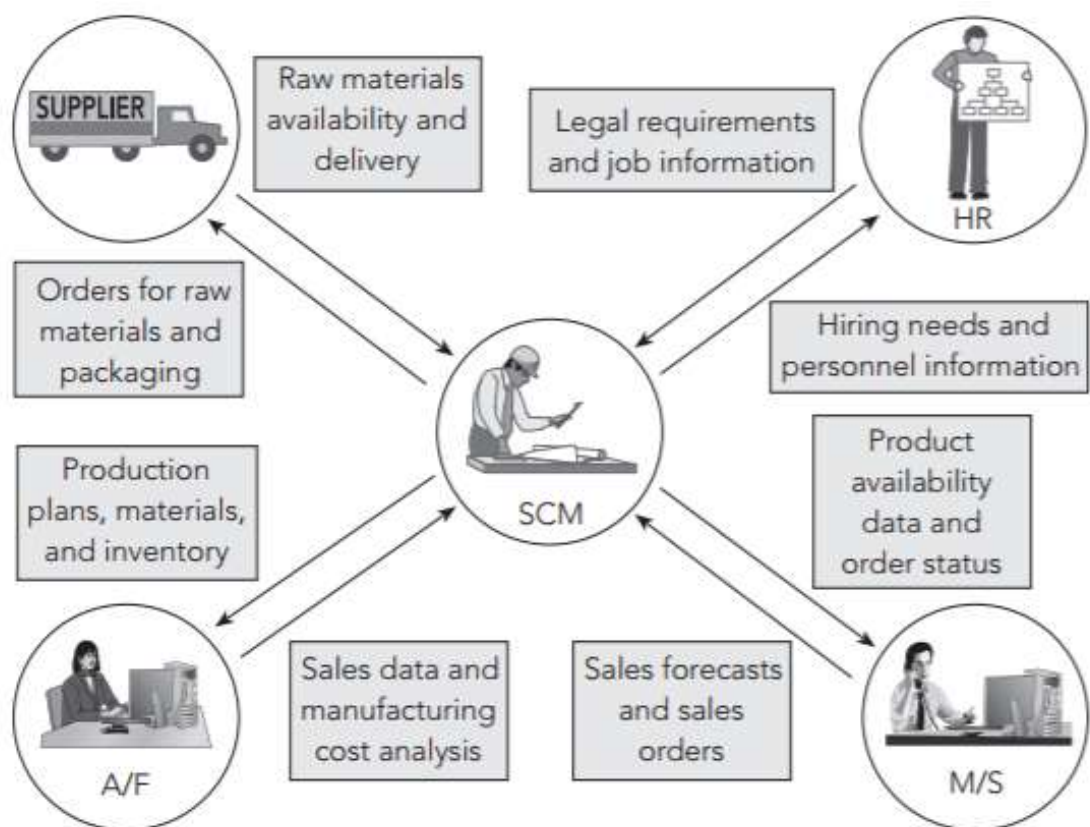


Figure 1. Data exchange between functional areas (Monk & Wagner 2012, p. 9)

Data exchange between functional areas of operation is crucial. Supply Chain Management receives information about inventory levels, layoff and recall company policy, product sales data, and production plans from other departments,

whereas the same department provides the other departments with hiring information, production and inventory reports, raw material orders, packing orders, and resource expenditure data. For example, Supply Chain Management receives information about sales forecasts and orders from Marketing and Sales, whereas Supply Chain Management provides Marketing and Sales with information about product availability data and order status. Both functional areas benefit from the data exchange and without data exchange, it is impossible for a company to operate. It is significantly easier to base orders of raw materials on existing inventory levels, production plans and expected shipments than guessing what to order and how much. Accurate data exchange also keeps inventory levels low resulting in saving money. On the other hand, inaccurate data exchange may result in stockouts and shortages, which is not desirable. (Monk & Wagner 2012, p. 10-12.)

The supply chain plays an important role in defining the competitiveness of the company and performance in the market. In most companies, this has not been noticed until a few years ago. However, companies still have difficulties in defining supply chain management and how it connects with other businesses, which complicates optimization of supply chains. (Camerinelli 2009, pp. 5-6.)

### **3.2.3 Purpose and objectives**

The reasons for introduction of supply chain management systems include globalization of the companies, products' complexity, and rapid market changes. Positive outcomes of introduction of supply chain management systems include improvement in certainty of supply, reduction of stocks, and shorter production times. Conversely, there are also risks in introducing supply chain management systems, such as weak security and reliability in large systems and unbalanced business relationships. (Tekes 2001, pp. 30-31.)

The main objective of the supply chain management is to increase sales and lower costs, as well as aim at taking advantage of the company's resources more efficiently by enhancing communication between parties in the supply chain. Ben-



efits of successful supply chain management include product development acceleration, improved change management, and avoidance of interruptions and delays in the supply chain. (Yrityssuomi 2012.)

The supply chain management system can be used as an aggregator or unifier between ERP systems. Information is distributed among ERP systems - between the same system vendor and others' system vendors as long as the data is in compatible form. The supply chain management system can also be used to harmonize information. The supply chain management system increases extra functionality in the data transmission and, that is why, supply chain management is a good centralized system for decision making. (Logistiikan maailma - Reijo Rautauoman säätiö 2015b.)

### **3.2.4 Logistics**

Concepts Logistics and Supply Chain Management are often used as synonyms. On the one hand, that is a correct assumption, but they are just considered from a different point of view. Logistics is usually referred to the management of material flows in one company or industry, whereas supply chain management aims at optimizing the entire network of cooperation. (Logistiikan maailma - Reijo Rautauoman säätiö 2015b.) Logistics means productive and cost-effective procurement, storage, transportation, and distribution related to the design and implementation of materials and services while simultaneously taking customer needs into consideration (Ritvanen, Inkiläinen, Von Bell & Jouko 2011, pp. 19-30).

Supply chain management is a wider concept than logistics, as it also covers information about products and money management from raw material production up to retail (University of Vaasa - Department of Computer Science n.d.). The goal of supply chain management is to organize purchasing in a way that leads to the most profit for the company. Supply chain management focuses on many functional areas: purchasing, manufacturing, selling, marketing, and IT, all of which have closely tied connections to one another. (Hoeven 2011, p. 118-119.)

### **3.3 Practice-based thesis**

#### **3.3.1 Background**

The aim of the education in a university of applied sciences is that a student can work in their field of expertise after graduation and know and understand the foundation of research and development (Vilkka & Airaksinen 2004, p. 10). One option for a thesis at a university of applied sciences is called a practice-based thesis (Vilkka & Airaksinen 2004, p. 9).

In most cases, a thesis is the first independent work of a student, in which the student is able to transfer the learned know-how into a real work life project. Consequently, the student can reflect his or her knowledge on working life both theoretically and practically, as well as evaluate the suitability of his or her own competence in working life. (Vilkka & Airaksinen 2004, p. 17.)

Practice-based theses have been done for many years in the field of social services. In recent years, the practice-based method has also played a more significant role among the theses of the business field. This type of thesis gives a student a new perspective and a chance to explore and apply the theory related to the subject. Of course, in some cases, theories can even be tested in the functional part of the work. (Dul & Hak 2008.)

#### **3.3.2 Concept**

A practice-based thesis consists of two parts. The first part includes a functional work, also known as development work, whereas the second part includes a written report describing the process. The second part is also referred to as documentation. (Vilkka & Airaksinen 2004, p. 9.)

A practice-based thesis tests how well the author can deal with integrity management, time management, innovative working life development, co-operation, and expressing competence both verbally and in writing. The bachelor's thesis is a step towards professional growth and it reflects the author's own professional growth. (Vilkka & Airaksinen 2004, pp. 159-160.)

It is advised that a student finds a company or an organization for a practice-based thesis. This way, a student can show his or her skills more widely and attract interest in working life. Additionally, a topic from working life supports professional growth when a student can solve a practical problem. (Vilkka & Airaksinen 2004, pp. 16-17.) The practice-based thesis can also play a very important role in the everyday life of the contracting firm or help other readers to imagine different solutions. Additionally, the author of the thesis learns through his or her own concrete work and the related theory. (Dul & Hak 2008.)

At this point, it must be noted that an “action research” is not the same thing as a practice-based thesis. In an action research, the researcher activates the research objects. The researcher and the examinee together develop procedures and skills suitable for the research objects and the researcher gives them scientific tools to solve practical problem situations. (Vilkka 2006, pp. 76, 123.)

### **3.3.3 Purpose and objectives**

The practice-based thesis targets instruction and guidance of actions in practice, organization of activities and rationalization of those actions in a professional field. It could be, for example, an orientation guide or an execution of an event such as arranging a trade fair or holding a lesson for students. (Lumme, Leinonen, Leino, Falenius & Sundqvist 2015.) “Doing” and writing interact with one another from the beginning until the end of the process. In the thesis, it is important to combine practical implementation and reporting in the means of research communication. (Vilkka & Airaksinen 2004, p. 9.)

The purpose of the practice-based thesis is to detect a problem in the contracting firm and provide a solution to it (Vilkka & Airaksinen 2004, p. 8). The output of the thesis should always be based on the professional theory and subject knowledge, and the choices made in the thesis must be justified based on that theory. The result of the practice-based thesis is a concrete product, which the client can take advantage of in their company operations. (Vilkka & Airaksinen 2004, p. 9.) Thus, creating new processes, as well as further developing already existing ones, are an integral part of the development project (Laurean ammattikorkeakoulu 2007).

One of the goals of the practice-based thesis is to clarify the target group's knowledge of the subject through a guide or guidance (Vilkka & Airaksinen 2004, p. 38). A practice-based thesis process is difficult to accomplish without choosing a target group. The target group helps the thesis author choose the most appropriate option from the contents from the selected set, and the target group, and determining the target group play an important role in limiting the work. (Vilkka & Airaksinen 2004, p. 40.)

#### **3.3.4 Thesis report**

The thesis report is a text that explains what, why, and how the thesis has been done, what kind of work process it has been, and what kind of results and conclusions have been reached. The report also shows how the learner evaluates his or her own learning and the output accomplished. (Vilkka & Airaksinen 2004, p. 65.) In a practice-based thesis, research is mainly reporting what has been done, in contrast to an ordinary thesis (Vilkka & Airaksinen 2004, p. 9). However, the thesis report must meet the requirements of research communication (Vilkka & Airaksinen 2004, p. 65).

#### **3.3.5 Functional work**

The thesis includes, in addition to the report, the product itself (output), which is often in a written form, for example, a guide. The product speaks directly to the target group and user group. It is required that the concrete output of the thesis has other types of textual features - if the output is a guide for the staff of the company, text must be different from the report itself. (Vilkka & Airaksinen 2004, p. 65.)

It is important that the text is easy to read and understandable so that the introduction of the output would be as smooth as possible (Vilkka & Airaksinen 2004, p. 65). The text of the functional work must serve the target group and expressions must be adapted in terms of the contents, target, recipient, communicative context, and genre (Vilkka & Airaksinen 2004, pp. 51-53).

When a bachelor's thesis turns out to be practice-based, with the output being some kind of guide or handbook for example, a source criticism makes a huge

difference in the work. Sources of information need to be thought through carefully, with consideration for where they have been acquired from and which of them will be used in the thesis. Of course, reliability and accuracy of the information must also be checked and reasoned. The number of sources is never the basis for evaluating a practice-based thesis. Quality and suitability of the sources can be considered a basis for the evaluation. (Vilkka & Airaksinen 2004, pp. 55, 76.)

The outcome of the practice-based thesis, a functional work, can be either in electronic form or printed. The objective is to have an outcome, which is unique and personal and which clearly differs from similar works. (Vilkka & Airaksinen 2004, pp. 51-53.)

### **3.3.6 Implementation process**

Since the functional part of a functional thesis is relatively broad, it is not appropriate or even possible to cover all the theory related to the operational part in terms of time; therefore, the functional thesis report is usually shorter than an ordinary thesis report. It must be remembered that a practice-based thesis includes two works in contrast to the ordinary thesis, which includes only one. In this case, it is good to distil the theory down to the most essential topics and review the rest of the theory just superficially in order to keep the thesis within the time limits. (Vilkka & Airaksinen 2004, p. 43.)

In a functional thesis, research can also be used as a basis for a data source, but this may not be appropriate. Thus, temporal and mental resources must be taken into account when planning the work. The extent of the credits of the Bachelor's Thesis limits the amount of work. (Vilkka & Airaksinen 2004, p. 56.)

In a practice-based thesis, it is important to combine two elements: execution and reporting. In order to organize it, it requires exploration of the subject and searching for suitable practices. (Vilkka & Airaksinen 2004, p. 19.) Methods used in a practice-based thesis, theoretical framework and possible problems, all affect the implementation of the thesis (Hirsjärvi, Remes & Sajavaara 2010, p. 65).

It is recommended that the author of a functional thesis, should keep a diary or journal during the thesis process. The diary works like the writer's memory, but the use of it should be systematic. The author gets the best out of it if she or he writes not only the ideas, thoughts, and reflections related to a single theme, but also relevant literature and sources related to it. (Vilkka & Airaksinen 2004, pp. 19-22.)

## **4 Thesis process**

### **4.1 Background**

The thesis idea emerged in May 2017 as I started working for the company for the first time. I proposed the initial thesis idea to the manager of the company in August. Before the proposal, I had been developing and planning the idea carefully for a while.

The idea was approved by the end of August, after which I started to work on the project promptly. The degree program manager of Saimaa University of Applied Sciences approved and signed the topic approval form in the beginning of September, which led to the preparation of the cooperation agreement between the author, the school and the contracting firm. After the cooperation agreement was signed by all parties, I contacted the contracting firm and arranged a meeting at Imatra Mills in the same week.

As all the parts of the agreement had to be separately approved by all parties, it took some time to agree on the terms of the agreement. We were mostly communicating via email, so writing and receiving answers was not always straightforward. I was the person responsible for communication between the school and the company, as the two parties were not directly in touch with one another.

During the first meeting at Imatra Mills, I presented my preliminary plan for the orientation guide which I had been preparing for the last few weeks. We discussed possible topics of the orientation guide with the company representative and started working on the project. I also consulted other supply chain coordinators in the company about the orientation guide and its contents. As the aim of

the orientation guide is to serve the target group of new employees as well as possible, I sought to gather as many opinions and ideas as possible.

## **4.2 Topic Analysis**

Topic Analysis was completed after the first meeting at Imatra Mills and approved by the school supervisor in the following week. Topic Analysis included the topic of the thesis, justification of the topic, objectives and delimitations of the thesis, theoretical framework, research methods, presentation of the case company, and a preliminary list of references and timetable (Saimaan ammattikorkeakoulu 2017a).

## **4.3 Topic Proposal**

Topic Proposal was completed in October and it was presented in a seminar by the end of that month. Topic Proposal contains the background, objectives and delimitations, research questions, theoretical framework, research method, presentation of the case company, timetable, sources, major headings, structure and a preliminary table of contents of the thesis (Saimaan ammattikorkeakoulu 2017b).

Topic analysis resembles topic proposal. However, the former is more concise than the latter. Topic analysis builds the basis for the topic proposal, so it only outlines the main topics on a high level. On the other hand, topic proposal requires the author to plan carefully what should be included in the thesis. The topic proposal builds a basis for the introduction-chapter of the final thesis, and thus, is of high importance.

Topic analysis and proposal play an important role in the success of the project. They force the author of the thesis to carefully examine the subject. In many institutions, the thesis consists of the final product alone, which puts a lot of pressure towards the end of the degree. Topic analysis and proposal push towards building a timetable, which is highly relevant for the success of the thesis.

## **4.4 Functional work**

In the functional work of the thesis I simulated the everyday work process of a supply chain coordinator. For example, I created an imaginary overseas customer order in the ERP system of the company. I carefully simulated the buying and delivery process of goods, including order handling and follow-up, which are key responsibilities of a supply chain coordinator (Alchemy Recruitment Ltd 2017).

### **4.4.1 Data collection**

I acquired the data for the orientation guide by physically visiting the company several times. However, a separate access tag was requested each time. The mill area is strictly isolated from its surroundings and entry is prohibited without permission. Visitors must request a separate permission each time, and the permission needs to be approved by an employee working in the company.

Data could only be acquired directly from the ERP system. As the system is custom-designed for the company and unique in the forestry industry, there is no information about the system available on public platforms. The system is a very reliable source material for the functional work.

It was occasionally difficult to find the wanted information in the systems due to the broad coverage of the systems such as the Intranet. Identifying the correct search word was one of the challenges.

### **4.4.2 Implementation process**

All meetings at Imatra Mills were planned well in advance. As the mill is not located in Lappeenranta, commuting takes 45 minutes by car. Due to the remote location of the mill, only a limited number of visits could be arranged. Through detailed preparations, the visits were made highly effective.

The time reserved for each meeting was also limited. Due to the lack of a paid employment contract, I did not have free access to the area. As a result, I needed



to be supervised every time I entered the area, and could not go without an appointment. The date, time and meeting place needed to be approved by the company representative as well. These limitations further emphasize the importance of planning and using the limited time of the company representative effectively.

One of the main obstacles during the process was that without an employment contract I was not able to get my own credentials for any of the systems used in the company, such as access to the Intranet, which was the most important tool in the project. Therefore, every time I had to search for any information, I had to rely on someone else's, often the manager's computer and credentials. I also had to be supervised every time while collecting data from the systems. This unexpected complication prolonged the data collection phase of the thesis.

Another obstacle was the lack of real order data. Without an order number, the system could not execute all the follow-up steps that I initially wanted to include in the orientation guide. The reason for this is that some features of the ERP system require a real order number so that the system would let the user proceed.

Even though the initial plan was clear, modifications were made as new ideas emerged. As the work progressed, I learned new things and, for example, what was difficult in the beginning turned out to be easy in the end, which demonstrates the learning process well.

Even though the old orientation guide exists, I could not use it as source material for the new guide. The pictures in the old guide were taken from the older version of the ERP system and were no longer valid. Each picture therefore had to be taken again. I also improved the structure of the guide and presented more detailed step by step instructions compared to the old orientation guide.

Along the thesis process, we had various development discussions with the representative of the contracting firm. For example, the structure of the orientation guide was modified many times according to the wishes of the contracting firm. The cooperation and communication with the firm was extremely smooth and I received a lot of constructive feedback which helped me further improve the guide.

#### **4.4.3 Writing process**

The whole writing part of the thesis I completed at home, library or school. Due to the limited time available during the on-site visits, most writing up was completed in retrospective. As the time was very limited to be physically at the company, I decided to focus on the most important things when visiting there – especially things that were not possible to be done at any other place except at the office.

When writing outside the office, it presented a challenge for recalling all of the many details of the ERP system and it was sometimes very hard to try to remember everything without seeing the system in front of the eyes. Many times writing was executed based on what I remembered by heart about the system and it turned out to be very challenging as the system includes a huge number of details.

The practice-based nature of the thesis resulted to a significant workload, namely two reports instead of one. In total, the reports amounted to 132 pages, prolonging the writing period significantly compared to an ordinary thesis process including only one output.

In particular, the photo editing phase was very time-intensive. All of the photos, pictures and screenshots selected in the orientation guide had to be edited, including cropping and adding special effects. This process was repeated several times to include new ideas and make the orientation guide as professional as possible.

#### **4.5 Thesis report**

Another part of the writing process is producing the thesis report. I looked for reliable theoretical explanations for the key concepts of the thesis. I reviewed numerous sources, including books, journals, articles, and online sources to form a balanced view.

The source material of the thesis consists mainly of sources in Finnish language, but it also contains a lot of sources in English language. The theory part of the

practice-based thesis includes mainly Finnish sources because there is not much information available of practice-based thesis.

During the writing process, a journal was kept to promptly record new ideas. Some of these ideas later fed into the thesis, following some critical assessment. It is crucial to critically analyse them when choosing which ideas should be used in the actual thesis. (Luukkonen 2004, p. 172.)

## **5 Assessment of the thesis process**

This chapter includes the assessment of the thesis process. The evaluation of the thesis is usually based on the purpose and objectives set for the thesis. The target group can be used for the overall evaluation of the thesis as well. (Vilkka & Airaksinen 2004, p. 40.) In the thesis, it is recommended to consider how the criticality has been achieved and whether the thesis is convincing and consistent (Vilkka & Airaksinen 2004, p. 159).

The thesis process went relatively well taking into account all the obstacles that I faced along the way. I was working very hard for the whole autumn and overall the whole project was very time-consuming. Usually, the thesis process includes only one output, but in my case, there were two: the written report describing the process as well as the functional work. Sometimes, it was hard to focus on both of them but I think I ultimately succeeded.

The thesis report is written in a coherent and cohesive way so that the reader interested in the study is able to get acquainted with the work process and the written text as well as interpret and understand it as well as possible. Thus, it enables interaction between the authors of the thesis and the reader (Vilkka & Airaksinen 2004, pp. 51, 66).

The purpose of the practice-based thesis is to produce text that serves the target group as well as possible and, that is why, this thesis has been written from a perspective of a new employee in order to reach that purpose. Additionally, the aim of the thesis is to create an output that is personal and individual, which has been achieved well in the work, in my opinion. The guide serves new employees

by providing them with a meaningful, clear, informative and coherent output. (Vilkka & Airaksinen 2004, pp. 51-53.)

I tried to keep the text clear, easy and coherent so that the threshold of introducing the orientation guide would be as low as possible and it would be easy to modify it in the future according to the changing needs of the company. I also paid some extra attention to the headlines of the functional work, precisely because of this. Therefore, it is easy to find the necessary information based on the headings in the table of contents. The functional work has also been built up in chronological order, which helps the reader follow the instructions more easily.

What should absolutely be mentioned is that the thesis built a great foundation for my future career path. Next year, I will apply for the same position in the company once again and after doing a thesis about the subject, I will be much more qualified in the subject. The thesis taught me a lot of new skills, which I am able to take advantage of in the future.

## **6 Summary**

This chapter includes a summary of the thesis. The thesis dealt with designing and creating an orientation guide for a supply chain coordinator working at Stora Enso Imatra Mills Consumer Board. The orientation guide specifically targeted new employees starting in the position for the first time as well as rotation workers and substitutes. Data for the orientation guide were mostly collected by the enterprise resource planning (ERP) system used in the company called Fenix. The theoretical framework of the thesis included concepts, such as enterprise resource planning (ERP), supply chain management (SCM) and practice-based thesis. The information in the theory part was gathered from literature, journals, articles, newspapers, and online sources.

The first chapter of this report included the introduction. The second chapter presented the case company Stora Enso Oyj and introduced the concepts closely related to the company: Imatra Mills, Consumer Board, Supply Chain Coordinator and Fenix. The third chapter introduced the theoretical framework including the

concepts of enterprise resource planning (ERP), supply chain management (SCM) and practice-based thesis, whereas the fourth and fifth chapter contained a description and assessment of the thesis process. The final chapter presented the conclusions and discussion.

The practice-based thesis consisted of two parts. The first part included a functional work, also known as development work, and the second part included a written report, which described the thesis process. (Vilkka & Airaksinen 2004, p. 9.)

Overall, the orientation guide amounted to 88 pages in total. The reason why the functional work has not been attached in this report is due to the confidentiality matters of the commissioning company. In addition to that, the thesis report was approximately 44 pages. All in all, the whole thesis work amounted to 132 pages in total. The process took many months of full-time work, and there were many obstacles along the way. However, I survived and successfully completed the work.

## **7 Discussion**

This chapter includes discussion. The significance of the topic to the target group cannot be highlighted too much. It is essential to provide new employees as well as rotation workers and substitutes with clear instructions and guidelines on how to perform a certain task. This enables the company to save money and thus increase its' competitiveness in international markets.

The introduction period will be much shorter for the employees and they are able to learn the job much faster and experience feelings of success, which make them feel important – they feel that they really make a huge difference to the performance of the company. The new employee is able to learn the tasks individually with the help of the orientation guide and the trainer's precious time will not be wasted. This is likely to raise the overall productivity of the company compared to a scenario where a new joiner is trained for many weeks or even months. Ad-

ditionally, current employees receive a useful guide to perform the essential functions needed in the company. It is a resource that they can use to review processes that are no longer familiar.

## Figures

Figure 1. Data exchange between functional area (Monk & Wagner 2012, p. 9), p. 23

Figure 2. Evolution of ERP history (Monk & Wagner 2012), p. 17

## Tables

Table 1. Stora Enso Divisions (Stora Enso 2017c), p. 11

Table 2. Examples of functional areas of operation and their business functions  
(Monk & Wagner 2012, p. 2), p. 15



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